Twin Circumflex Arteries with Left Sinus of Valsalva Origin: A Case Report

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ABSTRACT

Coronary artery anomalies are not uncommon. The importance of coronary anomalies varies from unimportant to life threatening. Herein, we report for the first time twin circumflex coronary arteries originating separately from the left sinus of Valsalva.

KEYWORDS: Coronary artery anomalies, twin circumflex arteries, left sinus of Valsalva

Coronary buds on the aortic sinuses connect with vascular plexuses leading to the development of coronary arteries in the 15th week of fetal development.¹ Malformation within one of these systems may cause coronary artery anomalies. Coronary artery anomalies have been identified in 0.6 to 1.5% of coronary angiograms in the general population.^{2,3} The importance of coronary anomalies varies from unimportant to life threatening.² Herein, we report for the first time twin circumflex (CX) coronary arteries originating separately from the left sinus of Valsalva.

CASE REPORT

A 48-year-old hypertensive man presented with exertional chest pain that started 3 months before his evaluation. His physical examination, echocardiogram, and electrocardiogram reports were all normal. He underwent coronary angiography elsewhere, and they recommended percutaneous coronary intervention for the right coronary artery (RCA). We analyzed the previous coronary angiograms and detected that injection of radiopaque material into the left coronary sinus revealed two separate ostia in the left sinus of Valsalva. The CX1 artery had an ostium separate from

the left main coronary artery (LMCA) and was normal (Fig. 1). The LMCA divided into the left anterior descending (LAD) and the CX2 arteries. The LAD artery had a noncritical lesion, and the CX2 artery had a 90% stenotic lesion (Fig. 2 and Fig. 3). The RCA had an 80% stenotic lesion. Percutaneous coronary intervention (PCI) with stent implantation was performed to the stenotic lesions of the CX2 and RCA arteries, and the patient was discharged without any complication.

DISCUSSION

Normally, the LMCA originates from the left sinus of Valsalva and gives rise to the LAD and CX arteries. The CX artery courses in the left atrioventricular groove and provides the first obtuse marginal branch. The most frequently found anomalies include a CX artery with a separate origin of the LAD and CX arteries, followed by a CX artery arising from the right sinus of Valsalva or the RCA.⁴ Although there have been several cases of dual origin of a CX artery,⁵⁻⁷ CX artery arising from the main stem and an anomalous CX artery from a separate ostium in the left sinus of Valsalva has not been reported to date.

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Figure 1 Right anterior oblique projection. CX1, anomalous circumflex coronary artery arising from a separate ostium in the left sinus of Valsalva.

Figure 3 Right anterior oblique projection. CX2, circumflex coronary artery arising from the left main stem in the left sinus of Valsalva; LAD, left anterior descending artery.

The most important problem in diagnosing double CX arteries is the separate origin of the two CX arteries from different ostia on the left aortic sinus of Valsalva. Thus, the angiographer must always keep in mind this possibility. Multidetector computed tomography might be an alternative or adjunctive imaging modality to coronary angiography because it is non-invasive, cost-effective, and a fast imaging tool that offers detailed evaluation of coronary arteries. To our knowledge, an aberrant but normal CX artery arising from the left coronary sinus (separate ostium) has no clinical significance. However, the clinical significance of the anomaly may be important in patients undergoing PCI or cardiac surgery.⁸

Figure 2 Right anterior oblique projection after percutaneous coronary stent implantation in CX2. CX1, anomalous circumflex coronary artery arising from a separate ostium in the left sinus of Valsalva; CX2, circumflex coronary artery arising from the main stem in the left sinus of Valsalva; LAD, left anterior descending artery.

We suggest keeping a high index of suspicion for a CX coronary artery anomaly if the posterolateral left ventricular myocardium remains avascular during left coronary artery opacification despite wall motion in that area being normal or if the usual coronary arteries are normal in the case of an acute coronary syndrome.

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